

Office Action Summary

Application No.

09/939,332

Applicant(s)

ASKARINAM ET AL.

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 16-19 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) 2-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 6-13, 16-19 and 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bang et al. (U.S. 6,110,556) in view of Okamoto et al. (Japanese Patent Publication 2000-252218), Fischer (U.S. 5,422,139), and Collins et al. (U.S. 6,077,384).

Referring to Figures 2 and 3, and column 4, lines 45-50, and column 5, lines 13-56, Bang discloses a chemical vapor deposition chamber comprising a vacuum lid 20 with base plate 48 (roof), a central recess 68 located in the bottom surface of the base plate 48, two gas distribution plates 72 and 88 mounted within the central recess 68, and opening 54 (center gas feed) which supplies gas (gas feed channel). In addition, a plurality of gas dispersion apertures 75 and 90 are provided in each gas distribution plate 72 and 88.

Bang fails to show blind radial grooves with apertures inside the grooves.

Referring to Drawing 3 and the abstract, Okamoto teaches that it is known to provide a facing plane 6 (gas distribution plate) with blind radial grooves 8. By using, radial grooves, a substrate with a thin film having uniform thickness and quality is produced. Thus, it would have been obvious to one of ordinary skill in the art at the time

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of the invention to provide the gas distribution plate of Bang with the grooves with bores as shown by Okamoto. This would provide a substrate with a uniform film thickness.

Referring to Figures 8 and 9, column 9, line 60 – column 10, line 21, Fischer shows a gas distribution plate with grooves 39 disposed in plate 37. Each groove contains bores 5a (plurality of apertures) to distribute gas evenly. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the grooves of Bang in view of Okamoto with the bores as shown by Fischer. This would allow the gas to be evenly distributed in the chamber.

Referring to Figures 35A-E and 36A-B, column 16, lines 21-27, and column 27, lines 11-66, Collins teaches a plasma reactor with a ceiling 110 (roof) made from silicon carbide. This material allows the ceiling 110 to act as a conductor that can be grounded and act as a non-conductor to transmit a RF induction field from an antenna. It would have been obvious to one of ordinary skill in the art at the time of the invention to fabricate the roof of Bang with a silicon-based material as shown by Collins. This material is highly resistant to etching gases and acts as both a conductor and a nonconductor.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 7, 10-13, 16-19, 21-23, 25, and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Bang et al. (U.S. 6,110,556) in view of Okamoto et al. (Japanese Patent Publication 2000-252218), Fischer (U.S. 5,422,139), and Collins et al. (U.S. 6,077,384) as applied to claims 1, 6, 8, and 9 above, and further in view of Wicker et al. (U.S. 6,129,808), and Wu (U.S. 5,910,221).

Bang in view of Okamoto and Fischer fail to teach that the roof and gas distribution plate are made and covered with silicon carbide.

Referring to Figure 8, and column 5, lines 10-43, column 6, lines 34-48, column 7, lines 31-50, and column 12, lines 16-24, Wicker teaches that it is known for a gas distribution plate 120 to be made from or coated with silicon carbide. This material has the desirable characteristics of high etch resistance, non-contaminating elements, and volatile etch products.

Referring to Figure 6, column 5, lines 46-53, column 6, lines 27-50, Wu teaches coating the plasma reactor's base plate 98 (roof) with a silicon carbide film 54. Moreover, the silicon carbide film is deposited using chemical vapor deposition (CVD). Silicon carbide CVD films reduce the production of particles and resultant contamination.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide or coat the roof and grooved, gas distribution plate of Bang with silicon carbide as taught by Wicker and Wu. This would provide high resistance to etch gases, and therefore prolong the life of the parts.

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Response to Arguments

5. Applicant's arguments with respect to claims 1, 6-13, 16-19, and 21-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC

Amc


GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700



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EXAMINER

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Please find below and/or attached an Office communication concerning this application or proceeding.